

1. Find the maximum rectangular area that can be enclosed by 452 m of fencing. [**l=113m, w=113m**]
2. A rectangular lot is bordered on one side by a stream and on the other 3 sides by 600m of fencing. Find the dimensions of the lot if its area is maximized. [**l=300m, w=150m**]
3. A rectangular area is enclosed by a fence and divided by another section of fence parallel to two of its sides. If the 600m of fence used encloses a maximum area, what are the dimensions of the enclosure? [**l=150m, w=100m**]
4. A senior's dance club has a \$5 cover charge and averages 300 customers on Friday nights. Over the past several months the club has changed the cover price several times to see how it affects the number of customers. They have discovered for every increase of \$0.50 in the cover charge, the number of customers decreases by 30. Analyze the situation and use an algebraic model to find the cover charge that maximizes the revenue. [**\$5**]
5. A ticket to the school dance is \$6 and usually 250 students attend. The dance committee knows that for every \$1 increase in the price of a ticket, 25 fewer students attend the dance. What ticket price maximizes revenue? [**2 \$1 increases or \$8**]
6. The height, h , in metres of a projectile launched at time, t , in seconds, is defined by the equation $h = \frac{81}{4} + 9t - 3t^2$. Find the maximum height reached by the projectile and the time at which it occurs. [**27 m at 1.5 sec**]
7. Byron throws a ball vertically upward from the top of a cliff is approximated by the model $h = 65 + 10t - 5t^2$, where h is the height in metres and t is the time in seconds. How high is the cliff? How long does it take for the ball to reach a height of 50m above the base of the cliff? [**65 m, 50m at 3 sec**]
8. Find two numbers whose sum is 16 if the sum of their squares is a minimum. [**8 and 8**]
9. Find two numbers that differ by 5 if their product is a minimum. [**-2.5 and 2.5**]
10. A rectangular field bounded on one side by a lake is to be fenced on three sides by 800 m of fencing. What dimensions will produce a maximum? [**w=200m, l=400m**]
11. A shoe store sells shoes at \$75 a pair. Research shows that a \$ 5 increase in the price of one pair of shoes results in 2 fewer pairs being sold. There are 15 pairs of shoes sold in one day.
 - a) Write the algebraic expression that models the Revenue for the company.
 - b) At what price must the company sell each shoes in order to maximize profits?
 - c) How many shoes must be sold at that price to maximize revenue?
 - d) What is the maximum revenue the company can make?
 - e) Sketch the graph representing this model and label all critical points.
 - f) What are the coordinates of the vertex? What is the significance of this point?
12. A clothing store sells a pair of pants at \$100 a pair. Research shows that a \$ 10 increase in the price of one pair of pants results in 5 fewer pairs being sold. There are 200 pairs of pants sold at a price of \$100.
 - a) Write the algebraic expression that models the Revenue for the company.
 - b) At what price must the company sell each pair of pants in order to maximize profits?
 - a) How many pairs of pants must be sold at that price to maximize revenue?
 - b) What is the maximum revenue the company can make?
 - c) Sketch the graph representing this model and label all critical points.
 - d) What are the coordinates of the vertex? What is the significance of this point?